

What is claimed is:

1. A spectroscopic ellipsometer comprising:

a lighting part for guiding polarized light to an object; and

5 a light receiving part for receiving reflected light which is said polarized light reflected on said object to acquire a polarization state at each wavelength of said reflected light,

wherein said lighting part comprises:

a light source part; and

10 a polarizer which is a polarizing element for acquiring said polarized light from light outputted from said light source part, and

at least one reflection mirror is disposed only between said light source part and said polarizer on an optical path from said light source part to said object.

15 2. The spectroscopic ellipsometer according to claim 1, wherein

said light receiving part comprises:

an analyzer which is a polarizing element on which said reflected light is incident;

and

a spectroscope on which said reflected light through said analyzer is incident,

20 said lighting part or said light receiving part comprises a rotation mechanism for rotating said polarizer or said analyzer, and

at least one reflection mirror is disposed only between said analyzer and said spectroscope on an optical path from said object to said spectroscope.

25 3. The spectroscopic ellipsometer according to claim 1, wherein

said polarizer is a sheet-like polarizing element.

4. The spectroscopic ellipsometer according to claim 3, wherein

said polarizer is a transmission-type grating polarizing element in which a plurality
5 of metal wires are arranged on a transparent plate at regular intervals.

5. The spectroscopic ellipsometer according to claim 1, wherein

a plurality of reflection mirrors are arranged between said light source part and said
polarizer.

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6. The spectroscopic ellipsometer according to claim 5, wherein

said plurality of reflection mirrors include a plurality of rotationally-symmetric
ellipsoidal mirrors.

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7. A spectroscopic ellipsometer comprising:

a lighting part for guiding polarized light to an object; and

a light receiving part for receiving reflected light which is said polarized light
reflected on said object to acquire a polarization state at each wavelength of said reflected
light,

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wherein said light receiving part comprises:

an analyzer which is a polarizing element on which said reflected light is incident;

and

a spectroscope on which said reflected light through said analyzer is incident, and

at least one reflection mirror is disposed only between said analyzer and said

25 spectroscope on an optical path from said object to said spectroscope.

8. A spectroscopic ellipsometer comprising:

a lighting part for guiding polarized light to an object; and

a light receiving part for receiving reflected light which is said polarized light
5 reflected on said object to acquire a polarization state at each wavelength of said reflected
light,

wherein said lighting part comprises:

a light source part;

a polarizer which is a polarizing element for acquiring said polarized light from light
10 outputted from said light source part; and

a plurality of rotationally-symmetric ellipsoidal mirrors disposed on an optical path
from said light source part to said object through said polarizer.

9. The spectroscopic ellipsometer according to claim 8, wherein

15 said polarizer is a sheet-like polarizing element.

10. The spectroscopic ellipsometer according to claim 9, wherein

said polarizer is a transmission-type grating polarizing element in which a plurality
of metal wires are arranged on a transparent plate at constant intervals.

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11. A spectroscopic ellipsometer comprising:

a lighting part for guiding polarized light to an object; and

a light receiving part for receiving reflected light which is said polarized light
reflected on said object to acquire a polarization state at each wavelength of said reflected
25 light,

wherein said lighting part comprises:

a light source part;

a polarizer which is a polarizing element for acquiring said polarized light from light outputted from said light source part;

5 another light source part for emitting auxiliary light;

an optical element for superimposing said auxiliary light on light from said light source part; and

a light shielding pattern disposed at a position almost optically conjugate to an aperture stop position of an optical system from said light source part to said object on an optical path from said another light source part to said polarizer,

said light receiving part comprises:

an analyzer which is a polarizing element on which said reflected light is incident;

a spectroscope on which said reflected light through said analyzer is incident;

another optical element for extracting said auxiliary light from said reflected light;

15 and

an image pickup part disposed at a position optically conjugate to said light shielding pattern, for receiving said auxiliary light from said another optical element to acquire an image of said light shielding pattern, and

said lighting part or said light receiving part comprises a rotation mechanism for rotating said polarizer or said analyzer.

12. The spectroscopic ellipsometer according to claim 11, further comprising

an operation part for obtaining a tilt angle of a substrate from an image acquired by said image pickup part and performing ellipsometry on a film formed on said substrate on the basis of said tilt angle and said polarization state.

13. The spectroscopic ellipsometer according to claim 11, wherein

said optical element is a pinhole mirror disposed at a position optically conjugate to an irradiation position on said substrate, having an aperture to which light from said light source part is led while converging, and

said auxiliary light is reflected on said pinhole mirror to be superimposed on said light from said light source part.

14. The spectroscopic ellipsometer according to claim 13, wherein

a pattern for focusing is formed on a reflection surface of said pinhole mirror, said spectroscopic ellipsometer further comprising:

a half mirror for reflecting part of said reflected light extracted by said another optical element;

another image pickup part disposed at a position optically conjugate to said pinhole mirror, for receiving light from said half mirror to acquire an image of said pattern for focusing on said substrate; and

an up-and-down moving mechanism for performing focusing by vertically moving said substrate on the basis of a contrast of image acquired by said another image pickup part.

15. The spectroscopic ellipsometer according to claim 11, wherein

at least one reflection mirror is disposed only between said optical element and polarizer on an optical path from said optical element to said object.

16. The spectroscopic ellipsometer according to claim 11, wherein

at least one reflection mirror is disposed only between said analyzer and said another

optical element on an optical path from said object to said another optical element.

17. The spectroscopic ellipsometer according to claim 11, further comprising
a plurality of rotationally-symmetric ellipsoidal mirrors disposed on an optical path
5 from said optical element to said object through said polarizer.

18. The spectroscopic ellipsometer according to claim 11, wherein
said polarizer is a sheet-like polarizing element.

10 19. The spectroscopic ellipsometer according to claim 18, wherein
said polarizer is a transmission-type grating polarizing element in which a plurality
of metal wires are arranged on a transparent plate at constant intervals.